

Water Heater Temperature/Pressure Relief (TPR) Valve

Improperly installed TPR valves are one of the most common defects noted on inspections.

Domestic water heaters are required to have a temperature and pressure relief valve. This relief valve provides protection in the event that the water heater thermostat or gas valve malfunctions, causing excess pressure/temperature. Modern water heaters are manufactured with a valve fitted for the specific unit. The termination point should be in an area visible to the occupants to alert them of any problems.

If not allowed to properly discharge, this excess temperature and pressure will eventually cause the tank to explode. One such tragedy occurred in Spencer, Oklahoma at the Starr Elementary School on January 9, 1982 where six children and a teacher were killed when the school's water heater exploded with the force and effect of two pounds of dynamite. This occurred due to a malfunctioning TPR valve.

Many water systems do not have back-flow prevention, which will allow the excess pressure to feed back into the water supply. This may keep the water heater from exploding; however boiling water or steam could be discharged through any fixtures that might be opened while the water heater is in an over-pressure, over-temperature failure mode.

The discharge piping serving a TPR valve should:

- Be constructed of an approved material such as CPVC, copper, polyethylene, galvanized steel, polybutylene, polypropylene, or stainless steel.
- Not be reduced in size from the outlet of the valve it serves (usually no smaller than 3/4").
- Be as short and as straight as possible so as to avoid undue stress on the valve.
- Be installed so as to drain by flow of gravity.
- Not be trapped.
- Discharge to the floor or to an indirect waste receptor.
- Terminate within 6 inches (152 mm) of the floor or waste receptor.
- Not discharge in a manner that could cause scalding.
- Not discharge in a manner that could cause structural or property damage.
- Discharge to a termination point that is readily observable by occupants because discharge indicates that something is wrong.
- Be piped independent of other equipment drains, water heater pans, or relief valve discharge piping to the point of discharge.
- Not have valves anywhere.
- Not have tee fittings.
- Not have a threaded connection at the end of the pipe so as to avoid capping.

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